

**Summary of information and other fact-finding for discussion by the SAB C-VPES. Interview summaries provided to Agency staff; their comments have been incorporated. Please DO NOT CITE OR QUOTE -- DRAFT 4/4/05**

**C-VPES Fact-finding relating to "Recent benefit analyses supporting national Agency regulatory actions"**

**Report on information gathered for the SAB Committee on Valuing the Protection of Ecological Systems and Services (C-VPES)**

**Background**

This document summarizes interviews conducted by Dr. James Boyd to: 1) understand a broader context for assessing ecological benefits associated with rulemaking; 2) to collect information on the overall process for conducting ecological benefits analyses and the extent to which individual assessments may relate to or build upon one another; 3) to ascertain whether EPA's understandings of the technical requirements (as they pertain to both the data and types of analysis) of E.O. 12866 and OMB's Circular A-4 may differ from the requirements as understood by OMB and others, and wishes to gather information on this topic; and 4) to gather information that will help the Committee develop advice that will be relevant and practical for EPA.

Dr. Boyd, with the Designated Federal Officer, Dr. Angela Nugent, present, conducted eight sets of interviews with EPA personnel. The list of interviewees, organized by EPA Office appears immediately below. The interview summaries appear as Attachment 1t.

1. National Center for Environmental Economics (NCEE). Participating from NCEE: Al McGartland, Director; Charles Griffiths, Natalie Simon; Nicole Owens; Sabrina Ise Lovell; Steve Newbold
2. Office of Policy, Economics, and Innovation, Office of Business Regulatory Policy and Management, Interview with Alex Cristofaro, Director
3. Office of Air and Radiation, Office of Air Quality Policy and Standards, innovative Strategies and Economics Group, Ron Evans, Leader, Bryan Hubbell, Linda Chappell
4. Office of Solid Waste and Emergency Response, Policy Analysis and Regulatory Management Staff, David Nicholas
5. Office of Water, Office of Science and Technology Engineering and Analysis Division (EAD) Mary Smith, Director, and Nick Bouwes, Chief, Economic and Environmental Assessment Branch
6. Office of Water, Water Policy Staff, Sharon Hayes, Director, Bill Anderson
7. Office of Water, Office of Wetlands, Oceans and Watersheds, Douglas Norton (ecologist).

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Dr. Boyd was not able to conduct an interview with the staff of OMB's Office of Information and Regulatory Analysis. In response to a request from Dr. Vanessa Vu, Dr. John Graham responded that OMB's Office of General Counsel determined that an interview was not possible. Dr. Graham provided a written response, included as Attachment 2 to this Status Report.

In the course of the interviews, Dr. Boyd noted that respondents raised several issues of importance to them related to rulemaking activities that have not been the focus of C-VPRESS deliberations. These items are noted below to inform Committee members and guide future planning of Committee activities.

1. Importance of Circular A-4, Data Quality Act, Paperwork Reduction Act requiring review of Information Collection Requests of more than 9 people. (NCEE, Cristofaro, OAQPS, Nicholas, OW-OST, OW-WPS)
2. EPA's Risk Characterization Guidance (NCEE)
3. Importance of building national-level models and data (OAQPS)
4. Expert Elicitation (NCEE, Cristofaro, OAQPS)
5. Use of BENMAP to support rulemakings (OAQPS)
6. Importance of "OMB accepting some exploratory approaches because the Agency will need some flexibility and take some risks to develop new methods and information. EPA and others will need to take some methodological risks to get information before the public to see if that information is useful" (OAQPS)
7. Identification of relevant population assumed to hold WTP values for non-use benefits (Cristofaro, Bouwes)
8. Discounting of future benefits (Bouwes)
9. Guidance on WTP bounds sufficient for a decision (Bouwes)
10. Benefits transfer (OW-OST, OW-WPS)

He also noted that interviewees raised several other issues related to valuing the protection of ecological systems and services that relate to regional activities or Agency requirements under the Government Performance Results Act (GPRA).

1. NCEE drafted appendix to EPA draft strategic plan that indicated the costs and benefits of different goals (potentially useful for GPRA work?) (NCEE)
2. ReVA work at the regional level was identified as having important potential for regional decision making support (OAQPS)
3. Use of BENMAP to support regional decision-making
4. Need for benefits assessments for rulemaking and GPRA to dovetail (Nicholas)

## **1. Attachment Interview Summaries**

### **Discussion with EPA's National Center for Environmental Economics (NCEE)**

**September 22, 2004**

**Participating from NCEE: Al McGartland, Director; Charles Griffiths; Natalie Simon; Nicole Owens; Sabrina Ise Lovell; Steve Newbold**

**Participating from SAB and the SAB Staff Office: James Boyd and Angela Nugent (Designated Federal Officer for the Committee)**

#### **Introductory Comments:**

DFO introduced the discussion by thanking participants and reminding them that their comments would be summarized in notes for the committee, which will be part of the Federal Advisory Committee Act public record of the Committee.

- Committee desires interviews to provide information this is frank and reflect the actual dynamic between EPA and OMB.
- Introductory discussion of how the process for reviewing benefit analyses has evolved:
  - Process for reviewing RIAs has changed over time. In the Clinton Administration, there was a "great process on paper"-- but it was not implemented. The analytical blueprint process called for documentation and review of planned analyses for rulemaking. In 5-6 years when this process was in place during the previous administration, only one full blueprint was prepared. Enforcing this process across the Agency was not a priority.
  - In current administration, there is more concern about analysis. The new administration was briefed on the actual process at the beginning. A high level workgroup, headed by Tom Gibson, formed to review the process. It affirmed that the documented process was a good one and identified clearer roles for the Policy Office, including NCEE and the Office of Business Regulatory Policy and Management, headed by Alex Cristofaro.
  - Even after those changes, implementation of a standard process for rulemakings was sporadic. NCEE worked side-by-side with the Air Office rules, which were active and high priority. Office of Water rules went forward to OMB without review and sometimes without analysis.
  - Steve Johnson, the Deputy Assistant Administrator, recently issued a memo calling for an analytical blueprint. It also called for an economic analysis plan to come to NCEE for review for major rules. NCEE has met with each program Office, Steve Johnson, and John Graham to talk about upcoming major rules and strategy for developing their economic plans, so that the analysis will be complete.
  - NCEE now clears the plan and technically reviews the RIA itself. The economic analysis plan is the plan for the economic analysis for the RIA.

The process for developing the RIA happens this way. A workgroup supporting a rule is formed. There is generally an OPEI staffer from Alex Cristofaro's Office, along with staff from OGC, ORD,

appropriate staff from Program Offices and OECA. There is also a subgroup that is an economic analysis team, formed for economically significant rules. NCEE provides a staff member to participate in that team. The workgroup develops options for the rule that float up to the political leadership to consider. There are 12-14 economically significant rules per year.

OMB is generally not involved at this early stage. There are some exceptions, such as the pilot project in the Air Office, where OMB is working collaboratively with EPA. That exception is important because the Air Office has so many high profile rulemakings. When a plan is developed, sometimes it is shared with OMB if there are particularly difficult analytical issues or little data (e.g., Drinking Water rule involving cryptosporidium).

The review process might change with administrations. The nature of the review and interaction with OMB depends on the Administrator's desire to "push back" and how connected the political leadership may be to OMB. Nevertheless, there usually is a mechanism for overseeing Agency rules. In the Clinton Administration, the Economic Policy Council played a review role.

NCEE's role is generally welcomed because it positions itself to help and Agency economists (and Agency as a whole) want quality economic analysis. NCEE does not serve just as the "tail end reviewer."

- Suggestion from NCEE. John Graham is very interested in expert elicitation for health and is working cooperatively with EPA on the PM expert elicitation pilot. Would OMB be interested in such an exercise related to ecological effects, given the dearth of data. Would the SAB C-VPES see that as a promising area?

## **1. Procedural and Management Issues**

Describe the process by which EPA and OMB interact on RIAs. Is most interaction formal (e.g. "return letters") or informal. Who specifically is responsible for ongoing interactions and negotiation?

- Most interactions are informal.
- "Return letters" only occur in extreme circumstances.
- Interactions between OMB and EPA vary on the type and level of interactions focused on the economic analysis.. They can be intensive (e.g., hundreds of interactions on collaborative projects) or few. The Office of Water 316b rule, for example involved half a dozen meetings. Art Fraas is the major contact.

Are RIA benefit assessments peer reviewed? If so, please describe the review process.

- EPA is doing an external peer review with a panel for the 316(b) analysis. For some rules, there is a letter review. Where there are no novel methods, NCEE does an internal peer review. These procedures follow the Agency peer review policy.

At what stages of the assessment process does EPA obtain public/stakeholder input? How does EPA do this? What are the types of input it receives?

- Public involvement happens when the Agency takes comment at the proposal stage on the economic analysis for the rule. This information is maintained as part of the public docket for the rule and is regarded seriously by the Agency. In the 316(b) rule, for example, there were many public comments, including those by regulated entities, on the analysis. Rob Stavins, for example, provided comments through this venue.

When does EPA request permission to collect new information to support an RIA benefit assessment? How does OMB review these requests? Does EPA feel that it is given sufficient latitude/time/resources to obtain the information it needs?

- Information Collection Requests (ICRs) are required when an Agency collects information for more than 9 people through focus groups and surveys. Review of these requests involves allocating time for public comment and OMB review. For a recent NCEE ICR for an economic survey, it has been a lengthy process. OMB sometimes approves an information request with caveats, such as having the survey results used for research only and not for regulation. OMB reviews the technical aspects of the survey and analyzes its appropriateness for the intended purpose.

How are EPA analytical resources (for benefit assessments for RIAs) decided on? Who makes these decisions?

- NCEE invests its resources in research benefiting the Agency as a whole and to reviewing analytical plans, but not in RIA development. Even for high-profile rules, such as arsenic, NCEE generally advises and participates in interactions with peer review bodies such as the SAB, but does not undertake the RIA. Resources for developing RIAs are borne by the program office. Generally, the Agency finds the resources to do the analyses because it recognizes the importance. RIAs are not cheap.
- There is growing awareness of the need for more economists at EPA. Hiring in program offices is constrained by ceilings on hiring new employees and problems recruiting good economists.

How much lead time is provided to EPA staff to conduct RIA ecological benefits assessments?

- Time pressures are significant. There are many (and stressful) court-ordered deadlines. There are great pressures to do rule making quickly, some driven by court and regulatory deadlines, some driven by managers.

Are individual assessment developed independently or is this activity centralized within EPA? If centralized, describe the way rule-specific information is collected and analysis is done.

- Process is not centralized; workgroup provides focus for joint discussion.

How much cross-office collaboration is there? How much cross-agency collaboration?

- NCEE is trying to foster cross-office information sharing and collaboration through the Agency Economic Forum, open to all, and an intranet site for sharing information. There is also an internal and external seminar series. NCEE staff also go on formal and informal details to other programs. There is, however, no other formal process for cross-office collaboration.
- Economic shops in different parts of the Agency differ in their focus. The Air Office has can account for tremendous health benefits for PM, and may not attempt to maximize net benefits for ecosystems. The Water Office, in contrast, focuses in great measure on ecological effects and must address all the unmonetized and unquantified benefits.
- There was an effort to collaborate across federal Agencies on eco-value issues at the time of the Exxon Valdez, but little cooperation has happened since then. NCEE was not staffed to maintain such collaboration and help the Agency benefit from it in the 1990s; it could do more of that now.

What type of training does EPA give its own or outside personnel involved in ecological benefit assessment for RIAs? What is included in the training?

- NCEE provides training on the OMB Guidance. It takes initiative to offer training on special topics, such as Quality Adjusted Life Years, NCEE staff Nicole Owens, Charles Griffith, and Steve Newbold will be giving a trial version of eco-benefit training at the upcoming SRA meeting.

## **2. Analytical Methods**

Does the agency make use of standardized protocols/procedures for benefit assessment? If so, describe the nature of those protocols or procedures. What guidance documents currently exist for the assessment process?

- More attention is being given to EPA's Risk Characterization guidance, which speaks to ecological risk characterization as well as human health.

To what extent is RIA ecological benefit assessment geared toward (a) showing that the regulation's benefits exceed costs vs. (b) assessing the relative net benefits of a range of regulatory alternatives?

- The thrust is net benefit analysis. Where there are ample data (e.g., for PM or drinking water), there's a push for benefit cost analyses for multiple options. Where there are fewer data, e.g., for mercury, it does not make sense to do multiple cost-benefit analyses.
- For 316(b), for example, quantified benefits are not near the cost (benefits expressed in thousands of dollars; costs expressed in millions).

OMB suggested EPA use physical measures and develop cost-effectiveness measures for different outcomes.

To what extent do you think OMB requires monetization of benefits?

- Sometimes monetizing benefits can be difficult and inappropriate studies are used, such as the "horrible CV study" used for snowmobile rulemaking. There is a need to value ecological benefits and it is interesting to strengthen efforts to use physical measurements. The Great Lake Water Quality Guidance raised this issue and Art Fraas called for an estimate of costs per lb through a case study. The Agency did this analysis. Having the SAB lay the ground work for this kind of analysis would be valuable. It is good to consider Circular A-4 and its section on quantified, non-monetized benefits in light of this question.

There may be a fear, however, in Program Offices that OMB may not accept such quantitative analysis, if it is provided.

- OMB's initial suggestion that Office of Water use physical measures for the 316(b) rule is a positive direction, but there is still fear for Program Offices developing the RIAs.

### **3. Audiences & Outcomes**

Who do you see as the audiences for RIA benefit analysis, and how would you rank them in terms of importance?

- Initial audience is the Administrator. Material from the draft IRA (whether monetized or quantified benefits or both) always is incorporated in briefing packages. Political leadership raises questions about how to convey analysis -- questions about ranges, best estimates, etc., and can identify issues with the analysis that can result in changes.

Apart from being a procedural requirement in the regulatory process, how do you think RIA assessments get used by other audiences?

- OMB incorporates EPA RIA information annually in the Thompson Report. In general, OMB affirms the value of the economic analysis. Numbers are taken seriously and supposed to be scientific, not political. NCEE staff also developed an appendix to the Agency draft strategic plan that analyzed the costs and benefits for different goals, based on rulemaking analysis.

In your personal view, have problems with benefit assessment affected either the development or promulgation of new regulations?

- Before John Graham headed OIRA, NCEE always had to defend PM benefits. Now John Graham highlights EPA's PM benefits in the Thompson report. Positive prompts from the Administration to strengthen analysis have been helpful. For example, OMB's question about the benefit/cost ratios for small systems dealing with arsenic were helpful questions to ask. On the other hand, there are regulations where EPA analyses show benefits exceed costs and our rules are frustrated.

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- In the Air Office, there is generally agreement between OMB and EPA on policy outcomes, but some issues about the types of analyses to be developed. Because there are so many data, this area is being used to set standards for priority rules. In the Office of Water, economists appreciate the challenge to be more rigorous and honest. Yet, if you are in a program office, with a fixed budget, and OMB is asking for a time-consuming, complex analysis, you have problems.

Which is more important: analyses at the frontier of assessment science or analyses that are most easily understood by non-technical audiences?

Economic shops in different parts of the Agency

- Some disagreement among economists generally on this. Strong view that if EPA can do analyses that are simpler and more effective and could reach a broader audience -- that would be good to do.

#### Suggested Action Items

1. Additional persons to interview:
  - a. Alex Cristofaro, OPEI
  - b. Mary Smith, OW/OST
  - c. Gary Ballard, OSWER
  - d. Bob Lee, OPPTS
  - e. Jim Laity, OMB
  - f. Kevin Neyland, OMB
  - g. Marcus Peacock, OMB
  - h. Bryan Hubbell, OAR/OAQPS
  - i. Rob Brenner, OAR
2. Nicole Owens to send to Angela
  - Copy/links to Thompson report
  - copy of recent Steve Johnson Memo on regulatory review processes
  - Appendix to recent EPA Strategic Plan where NCEE analyzed benefits associated with EPA's progress toward goals
3. Angela to provide Jim Boyd and the Committee with a copy of the Risk Characterization guidance.



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**Interview with Alex Cristofaro, Director, Office of Business Regulatory Policy and Management, Office of Policy Economics and Innovation, November 19, 2004**

In response to a question about EPA's internal processes with respect to Regulatory Impact Analyses (RIA) that impact ecosystems, Mr. Cristofaro outlined the process as required by Agency guidance and in actual execution. Individual EPA program offices are responsible for developing RIAs supporting their rulemakings. Official Agency guidance for rule development is documented. That guidance document requires the program office planning to issue a rule to designate it as a Tier 1, 2, or 3 rule, depending on the scope and expected impacts of the rule and for an Agency Steering Group to review this proposed designation. After the tiering designation is approved, rules of major importance, i.e., tier 1 or 2 rules, require establishment of a workgroup that would develop an "Analytical Blueprint" (which includes the RIA). Agency Guidance calls for analytical blueprints for Tier 1 and 2 rules to be approved by Assistant Administrators of the initiating program office and EPA "core offices" (Office of the Administrator, Office of Research and Development, Office of Policy, Economics and Innovation, Office of General Counsel, and Office of Enforcement and Compliance Analysis).

In actual practice, approval at this level has never happened. Many factors militate against such high-level sign-off. Program offices generally take the lead in the shaping of rules; there are time pressures from statutory or court ordered deadlines that accelerate development of blueprints; and it is difficult to get political appointees across the Agency to devote time and attention to reviewing plans for analyses supporting rulemakings.

In actuality, EPA staff across the Agency *do* collaborate to plan RIAs. Informal meetings with OMB occur to plan the scope of the documents at early stages of rule development. OPEI's Office of Business Regulatory Policy and Management, plays a role in these interactions as a facilitator and translator among groups in the Agency and with OMB. Occasionally, this group may "put options on the table." A current example is the work on the "Clean Air Interstate Rule," which is being developed under significant time pressures.

In reflecting on RIAs for rules with ecosystem-protection components, Mr. Cristofaro noted that RIAs often "rehash" past analyses. There are significant discussions within the Agency and with OMB over components added to adapt RIAs for previous rulemakings to current need. A current focus of discussion is the expectation that rules include more expert elicitation for effects that are not known. This is consistent with OMB's Circular A-4's call for strong uncertainty analysis. Mr. Cristofaro noted that the non-road diesel rule included an appendix that involved an expert elicitation pilot and that this pilot effort was peer reviewed.

The process for developing a rule doesn't, in practice, generally follow a straight path. The program office does all the analyses and other "AA's" give advice, such as noting the requirement to include two discount rates, how to treat uncertainty, and the kinds of analyses that will pass muster with OMB.

For rules focused on protecting ecosystems, Mr. Cristofaro noted that the SAB Committee on Valuing the Protection of Ecological Systems and Services might consider how expert elicitation could work as part of a benefits assessment. In his view, the critical need is for the Agency to identify likely endpoints that will be affected by a given rule. This contrasts with the Agency's current practice in which it typically picks any available endpoint for which there is a regression coefficient from a "good study." Economists then key their analysis to that coefficient. The overall result is thus greatly limited. Monetization is based on one narrow study whenever there is diverse expert opinion, uncertainty or lack of information on other associated effects. He suggested that the Agency would be better served by taking a decision analysis approach, where experts could help identify the suite of important endpoints and the likely effects of the proposed rulemaking on them. Economists could then monetize those effects where possible. He noted that OMB was open to expert elicitation techniques and that it would be "silly for the Agency" not to pursue this opening. He noted that expert elicitation itself was a technical field, associated with a sophisticated literature on how to pick experts and solicit and assign weight to their views. This literature should guide the approach.

He viewed expert elicitation as particularly appropriate to rules addressing ecological or ecosystem effects because such efforts will never have enough data on all endpoints to develop the kind of reliable regression coefficients that pass muster under the current approach. In essence, the ecological impact of EPA rules and the economic value that society attaches to different ecological outcomes is highly uncertain. Reducing the uncertainty is very expensive and time consuming, and perhaps even impossible. He suggested that the Agency might be better served by adopting analytic frameworks that better reflect this reality. Expert elicitation within a decision analysis framework might be worth examining in this regard.

Dr. Boyd asked about the merits of quantifying effects that cannot be monetized. Mr. Cristofaro responded that EPA does quantify effects. He referenced the Combined Animal Feeding Operations Rule and the Cooling Water Intake Rule as example. For the latter, he noted that the RIA included information on numbers of fish killed but did not address the ecological impact of those losses. The Agency did not address the population impact or the systems impact. He suggested that the midpoints of monetized benefits for the CAFO rule were "short of the costs" so OMB was not applying a strict benefit cost analysis and the presumption that the Agency was not able to quantify ecological benefits well actually worked to the benefit of the Office of Water.

In commenting on how to improve methods for benefit assessments of rules with ecological components, Mr. Cristofaro suggested that the current suite of tools was limited. Because of the nature of ecological science and ecological effects, it will be difficult, perhaps even impossible for the Agency to develop data persuasive enough to assess future impacts. The alternative of benefit transfer is not attractive and will always be challenged. Most people, in his view, place little confidence in the results of contingent valuation studies. Many question the concept of existence value and how it is implemented where the resources affected are not particularly unique; indeed that issue came up in the context of the Agency's Cooling Water Intake rule. He suggested that many view ecosystem protection as a moral, religious or ethical issue, rather than an

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efficiency issue amenable to cost-benefit analysis. Improvements in benefit quantification will not satisfy those that hold that view.

Mr. Cristofaro noted that the number of rules which address ecosystem effects are dwindling. A look at the upcoming Regulatory Agenda lists the few rules currently planned. He also noted that the Total Maximum Daily Load process is moving forward. States are taking on protection activities that formerly were conducted through effluent guidelines and regulation at the national level.

In response to a question about key rules to review to gain a sense of current Agency analytical practices, Mr Cristofaro suggested the benefit analyses for PM, Ozone, Cooling Water, Clean Air Interstate Rule, the Construction and Development Effluent Guideline, and the Aquaculture rule might give a good overview.

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**Conversation with Ron Evans, Bryan Hubbell, and Linda Chappell, Innovative Strategies and Economics, Group, Office of Air Quality Planning and Standards, Office of Air and Radiation  
October 19, 2004**

Discussion began with a short set of questions about whether the SAB Committee on Valuing the Protection of Ecological Systems and Services with the advice given the Air Office by the Advisory Council on Clean Air Compliance Analysis on ecological benefit characterization. The DFO said the SAB Committee on Valuing the Protection of Ecological Systems and Services has received briefings on this topic and that these efforts should be brought to the attention of the Committee again. Two Committee members, Dr. Kerry Smith, who currently serves on the Council, and Dr. A. Myrick Freeman, who served on the Council for several years, can help provide background too to their fellow members.

List of Questions for Fact Finding

**1. Procedural and Management Issues**

Describe the process by which EPA and OMB interact on RIAs. Is most interaction formal (e.g. "return letters") or informal. Who specifically is responsible for ongoing interactions and negotiation?

Will the 2004 memo from Deputy Administrator Steve Johnson change the process for developing ecological benefit assessments?

Economists in OAQPS don't anticipate a change; the memo "puts a spotlight" on cross-agency coordination, which had existed in the past with OPPE. Now OPEI will be playing that role and NCEE will be involved in intra-agency coordination and review. Over the last decade, individual program offices had worked more independently than before; there is now a renewed effort to coordinate across the Agency so that the Agency has a single position on issues. NCEE provides an Economics Forum, which is offering opportunities for coordination and discussion of topics of interest to program offices. Another example of coordination is the effort to update EPA's economic guidelines.

OAQPS is in a unique position and economists' role in it is not likely to change much. The Office has a dedicated economics shop, which has tried to serve as a leader for applied economics and benefits analysis, at the same time as the Air Office has had a very busy regulatory agenda since passage of the 1990 Clean Air Act Amendments. Since 1990, the Air Office has been responsible for about three-quarters of EPA's regulations. OPEI, in contrast, has been doing more theoretical work, cross-Agency coordination, and has been working with ORD on grant programs.

OAQPS already recognizes the need for coordination with other parts of EPA and coordinates with them in developing rules. The Steve Johnson memo may lead to additional awareness that ecological benefits are very difficult to quantify. There are few available analyses based on ecological service flows. It will become clear that quantified and monetized ecological benefits are only

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about 1% of human health benefits; the need to quantify additional benefits may become apparent. There is the potential that the Steve Johnson memo could help attract more resources for addressing the issue of ecological benefits.

How much lead time is provided to EPA staff to conduct RIA ecological benefits assessments?

OAQPS has undertaken significant efforts to develop methods to support rulemaking, but for individual rulemakings, economists currently end up "chasing available methodologies" that can meet rulemaking timeframes. It would be nice to have longer term schedules and develop appropriate methodologies for a given rule. OAQPS has been working for number of years on commercial forestry benefits for ecosystems. There have been an application track and a methodology development track. The development track lags far behind. For ecological assessments, for example, OAQPS attempts analyses and is "usually left with half completed analyses" that don't have a major impact on decisions. Areas that have been developed and are included in RIAs are agricultural and visibility effects, but these are minor ecological impacts.

- OAQPS has pursued efforts to characterize nitrogen deposition effects and has cooperated with the Office of Water, which shares a great interest in quantifying ecological endpoints associated with nitrogen deposition in estuaries. Despite that cooperation, there is "not lots of progress" and this issue is an example of the massive effort the Agency needs to undertake to characterize ecological benefits. EPA need to link air quality models with water quality models to impacts on fresh water rivers and streams. The Office of Water currently lacks a tool to model estuary changes. A comprehensive multi-media model is needed to link fresh water rivers and streams and estuaries. It will be a massive effort. The Office of Water does have a generic estuary model, but results are not transferable because each estuary is unique. One approach would be to develop types of estuaries for analysis. The Agency could start by focusing on estuaries where some model components exist. The Office of Water, Air, and other Agencies are interested, but there hasn't been a concerted effort or enough investment.

Developing such a model at the program level, rather than by NCEE, is appropriate because but program offices have more knowledge and expertise in integrated model frameworks. NCEE has excelled at survey-based valuation methodologies. It has focused on survey design, review and grants and can bring the Agency economies of scale. OAQPS, however, must look at very specific solutions to modeling questions. The Air Office has benefited from adoption of one modeling framework that can be used and adapted to national scale. In contrast, modeling in the Office of Water is location specific. One OW economist (John Powers) mentioned that his office spent \$100,000/year on water modeling for economic analysis. In contrast, ORD has 40 people and OAR 10 people working on the CMAQ models. Air models are required by regulations. The State Implementation Plans and attainment decisions depend on them and so the Air Office is "pushed" in the direction of developing national models. The mandates affecting the Office of Water are not, and so cross-media analysis is frustrated.

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Issues associated with Information Collection Requests (ICRs) are the single largest impediment to making progress on ecological benefits assessment. It is not just the time lag to publish a public notice in the Federal Register and allow for public comment. The real impediment is how OMB reviews proposals for surveys. The barriers and bars set very high and the review generally entails a 2- year process that cannot fit within a rulemaking timetable. Also, the standards set for survey response are extraordinarily high. Agency surveys need an 80-90% response rate to meet OMB's data quality guidelines. In the past, EPA was able to work with other organizations on survey work through cooperative agreements or grant mechanisms on survey work. Now such grants and cooperative agreements must also go through the ICR process.

The ICR impediment is real and also a perceived bar to development of RIAs. There is the general perception that it's not worth trying to develop a survey. Based on the few times EPA has tried, there have been significant hurdles. A two-year review cycle is the minimum; other ICRs have taken much longer in review, for example the 7-year review for NCEE. Surveys are rarely conducted for valuation. There is the sense that valuation surveys are held to higher standards than surveys for other kinds of information. OMB has draft ICR guidelines. Chris Dockins at NCEE may be able to provide a draft.

The data quality guidelines, however, can also be seen as "somewhat advantageous." OAQPS economists are interested in promoting clarity, transparency, and sensitivity analysis. The Data Quality Act helps justify the need for resources to strengthen necessary analysis.

## **2. Analytical Methods**

Does the agency make use of standardized protocols/procedures for benefit assessment? If so, describe the nature of those protocols or procedures. What guidance documents currently exist for the assessment process? In general, do you find Circular A-4 general -- encouraging because it calls for analysis or frustrating?.

Circular A-4 gives economists arguments to press for additional resources and to develop methodologies and a choice of tools. Generally speaking, OAQPS uses it as a rationale for investment in analytical areas that didn't exist in past. The Circular specifies the need for analysis of benefits and makes that analysis more important than they were in E.O. 12866. On the other hand, the Circular is "annoying too-- the document is variously prescriptive and general where it's convenient to be so and is not even handed." A prime example: there are details about barriers to benefits transfer, while for uncertainty assessments, analysts may just "use what you can find. " There is not an even-handed treatment of information sources--it would be more helpful for the Circular to ask analysts to justify their choices than to restrict information sources as specified."

To what extent is RIA ecological benefit assessment geared toward (a) showing that the regulation's benefits exceed costs vs. (b) assessing the relative net benefits of a range of regulatory alternatives?

To what extent do you think OMB requires monetization of benefits? How useful is it to provide quantified information that isn't monetized.

OAQPS has had success in both monetizing and quantifying incidences. Quantifying incidences has been a focus for method development at OAQPS. One of the method development efforts underway involves expanding the number of concentration response functions for different tree species. This has been a task for interns over several years. Another need is to look at the impact of mercury on impacts on reproductive rates of at-risk species. It is important to look at marginal rates, instead of comparing steady states vs. steady states. Economists also need a clearer understanding of the time path for ecological changes to provide economic analysis of impacts. There is also the need to gather a set of shared information on critical habitats. There is no standard approach for mapping critical habitats.

The non-road diesel rule is a good example of recent efforts to quantify effects. OAQPS also looks at patterns of air deposition with maps, looking at impacts on specific estuaries. EPA tried to take quantified information on impacts on estuaries and develop an avoided-cost approach, based on assumed reduction in loadings on estuaries from air deposition for the First Prospective 812 Analysis, but that approach was "shot down" because there was no guarantee that the cost would be avoided. There was resistance from the economic community, the Advisory Council on Clean Air Compliance Analysis and others. This was an example of an effort to try different approaches and methods that met resistance.

The heavy duty on-road diesel analysis also attempted to quantify its forestry analysis for different species. OMB has not rejected this approach; instead it has asked the Agency to put it in context.

To what extent do you think qualitative communication of benefits is important to OMB?

The Agency always needs to provide a qualitative discussion of benefits. OAQPS formerly included a "huge description" of ecological benefits. OMB asked the Agency to scale the qualitative discussion back to ensure the Agency was not trying to argue that the qualitative information trumped the quantitative information. The Agency then tried to provide estimates of quantitative impacts for effects formerly expressed as qualitative only; these estimates were rejected. Currently, OAQPS sets its own bar. It is focusing on effects where there are quantitative data and analysis and putting much less effort into qualitative descriptions.

One new approach might involve expert elicitation to develop a way to analyze effects for which there are no accepted quantitative data and analysis. OAQPS is working with researchers at RTI to expanding the concept of expert elicitation to include characterization of ecological impact. The general approach would be to involve experts in conjoint analysis. The approach would lay out options, each with different environmental attributes, and ask experts to make a series of choices from which could be derived indices of environmental quality. Those indices could be analyzed statistically and econometrically, matched with standard economic survey information, and integrated into a benefit analysis.

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Although John Graham generally regards expert elicitation as an uncertainty characterization tool, it could have broader applications. Such an approach would in some ways mimic and build on the Carson and Mitchell approach, which was a survey of experts. It is now being used by the Office of Water to derive their continuum of water quality.

Please describe the ways in which economists and non-economists (e.g., ecologists) interact in the process of benefit assessment.

The typical process is for economists to ask that ecologists "define something that can be economically valued," such as a service flow that can match with information that is economically measurable. This approach has led to OAQPS's focus on visibility (where there are service flows that match with survey data for WTP for services in national parks) and on forestry (where there are data on timber productivity in national forests that match with change in market model for timber use). But for non-market values, ecological services are not matched with what individuals can value and WTP methods are questioned.

Another difficulty relates to economists' needs to value marginal changes relating to policy choices that are at issue in EPA decisions. Those needs typically don't match up with the science on ecological impacts, which often does not focus on non-marginal changes. Economists generally and OAQPS economists also are not comfortable with Costanza type models.

It is important to deliver information that policy makers can understand. One cannot say to them "ozone is decreasing leaf foliage by 9%." Policy makers respond and ask "Why is that important?" One option is to identify multi-attribute indices related to ecological changes that are important to people. Those attributes could provide information that can relate to dollar values. There might be multi-attribute ecological effects, for example, relating to bird habitat that impact important economic variables, such as travel, recreation, visits to a national park, for example.

It is difficult to get the kind of information needed on the bio-physical side. Some scientists in ORD are responsive (for example, William Hogsett at EPA's Corvallis Lab), but most of the ecological work for ozone takes place outside agency (e.g., John Laurence at Cornell).

It's important to note that EPA's work on its draft *Ecological Benefits Assessment Strategic Plan* involved collaboration between economists and ecologists. EPA's work on ReVA is also multi-disciplinary and multi-media in nature and might be useful for regulatory work. The Office of Water economist, John Powers, has thought about this. The Office of Water also has more economists and ecologists working collaboratively than the Office of Air. Doug Norton, an ecologist in the Office of Water, would be good to talk with. It is striking that the Office of Air has good ideas for modeling air transport and is a leader in national modeling, but does not have such a good understanding of ecosystem effects. The Office of Water sees the ecological impacts, but doesn't have a national model.

### **3. Audiences & Outcomes**



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Who do you see as the audiences for RIA benefit analysis, and how would you rank them in terms of importance?

OMB is an important but not the only audience. RIA "go through them" before they become public documents. Affected members of the public and the academic communities use information in RIAs to help evaluate rulemakings and options. OAQPS is very conscious that its analyses are used by others for separate, independent analyses and is working on increasing the transparency of its publications. Many of the publications on the AERI website, for example, are based originally on OAQPS analysis.

One tool that could be used for ecological analysis by EPA and the public is the OAQPS product BENMAP, a GIS system for environmental modeling, which can use ambient data, and concentration-response functions, to help derive an economic analysis. BENMAP uses an audit trail concept that allows quick identification of parameters and assumptions with comparison with reference cases and other analyses. The program is available on the OAQPS website and on CD. Alan Krupnick of RFF peer reviewed it. BENMAP is now used for health and visibility; OAQPS has talked with the Office of Water about using for water benefits. It has also talked with Bill Hogsett at Corvallis about using it to analyze impacts on populations of trees, using the GIS mapping to derive service flows for economic analysis.

Final question: What would be most needed to make progress on benefits analysis supporting rules?

The most important need now is to encourage flexibility so that the Agency will have the motivation to develop methods. It would be helpful for OMB to accept some exploratory approaches because the Agency will need some flexibility and take some risks to develop new methods and information. EPA and others will need to take some methodological risks to get information before the public to see if that information is useful.

- The current situation is particularly frustrating because there is much theoretical work published, but most is not useful to the Agency.

**Discussion with David Nicholas (OSWER, Policy Analysis and Regulatory Management Staff)**

**September 23, 2004**

**Participating from SAB and the SAB Staff Office: James Boyd and Angela Nugent (Designated Federal Officer for the Committee)**

**Introductory Comments:**

Dr. Boyd introduced the background and context for the discussion. Mr. Nicholas welcomed the chance to discuss OSWER's needs and experiences. OSWER has not recently finalized a Tier 1 Regulation. Tier 1 actions are under consideration for the future to address the waste management issues on coal combustion.

Mr. Nicholas introduced the Tier 2 rulemaking proposed in the Federal Register on August 26, 2004 (69 FR 52542), *Standards and Practices for All Appropriate Inquiries*, which did not meet the \$100 million criteria, but required Economic Impact Analysis because it raised novel policy questions for the Brownfields program because it proposed a new standard for liability protection under CERCLA.

List of Questions for Fact Finding

**1. Procedural and Management Issues**

Describe the process by which EPA and OMB interact on RIAs. Is most interaction formal (e.g. "return letters") or informal. Who specifically is responsible for ongoing interactions and negotiation?

- OSWER worked with OMB after receiving guidance and assistance from NCEE. NCEE guided OSWER staff through the process, served on the workgroup chaired by staff in the Brownfields office, and collaborated on the rule. The project benefited from assistance from an economist in the OSWER/RCRA program.

OSWER did not develop a formal Economic Analysis Plan.

OSWER contacted OIRA formally, after EPA's internal review of the proposed draft rule was complete and the economic package was found by NCEE in compliance with EPA guidelines. OSWER worked directly with OIRA. Even before that formal contact, OSWER participated in informal discussions on the regulatory language and economic analysis (e.g., held one face-to-face meeting, four conference calls, sent many emails). Interactions were with the desk officer, Keith Belton, and with Amanda Lee, with communication via those desk officers with OMB's senior manager, Paul Noe. Feedback came in terms of redline-strikeout documents and questions posed to EPA during meetings.

Are RIA benefit assessments peer reviewed? If so, please describe the review process.

- The economic analysis that OSWER prepared for AAI and other rules are consistent with the Agency's guidelines for preparing economic analyses, which

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were peer reviewed. In addition, staff from NCEE review and comment on any benefits assessments prior to OMB review.

At what stages of the assessment process does EPA obtain public/stakeholder input? How does EPA do this? What are the types of input it receives?

- OSWER encourages public comment on the draft economic analyses for proposed rules as part of the proposal for the rule. There are only infrequent comments on the draft economic analysis, but members of the public do question cost assumptions or provide information to be considered.

When does EPA request permission to collect new information to support an RIA benefit assessment? How does OMB review these requests? Does EPA feel that it is given sufficient latitude/time/resources to obtain the information it needs?

- OMB's Information Collection Request (ICR) guidelines provide the rule for data collection. The program office must analyze the burden of any data collection they envision within the Agency's overall information collection budget under the Paperwork Reduction Act, and weigh those costs against the anticipated benefit of obtaining those data to meet requirements of OMB's Data Quality Guidelines.
- In the case of the *All Appropriate Inquiries* proposed rule, OSWER (working through the negotiated rulemaking process under FACA) decided to use existing information and the accompanying ICR was prepared to support implementation of the rule when final, as opposed to doing an ICR to collect new data in order to start a new rulemaking activity.

How are EPA analytical resources (for benefit assessments for RIAs) decided on? Who makes these decisions?

- Each Office Director makes the decision about resources to commit.  
For the *All Appropriate Inquiries* proposed rule, the project occupied a couple of staff in the Brownfields office and time from OSWER's Policy Analysis and Regulatory Management Staff and other OSWER economists. ICF consulting developed the economic analysis. In supplementary information provided after the interview, Mr. Nicholas provided the following information on the costs involved in developing the economic assessment: by the time the rule is final, OSWER expects to have spent about \$350,000. This may be on the low end of costs since the rule makes use of existing data and did not require analysis of risk assessments tied to cost factors as would be the case in a traditional regulatory impact analysis.  
OSWER has made analysis supporting regulations a priority, despite budget cuts in its extra-mural program. Resource constraints on OSWER may have impacted non-regulatory programs, but have not reduced funds for analysis.

How much lead time is provided to EPA staff to conduct RIA ecological benefits assessments?

- In this case, development of the rule took about 3 months—to clarify, the development of the rule and the economic assessment was preceded by over a year of work through the FACA committee. This was a quick process because there was a Congressional mandate.

Are individual assessment developed independently or is this activity centralized within EPA? If centralized, describe the way rule-specific information is collected and analysis is done.

- Decentralized process with NCEE providing centralized review.

How much cross-office collaboration is there? How much cross-agency collaboration?

- For this project, OSWER involved significant cross-program collaboration within OSWER

What type of training does EPA give its own or outside personnel involved in ecological benefit assessment for RIAs? What is included in the training?

- OSWER is eager to identify and make use of good training in ecological benefit assessment. Sees this as a good topic for SAB advice.

## **2. Analytical Methods**

Does the agency make use of standardized protocols/procedures for benefit assessment? If so, describe the nature of those protocols or procedures. What guidance documents currently exist for the assessment process?

- OSWER uses NCEE guidance and information. There is a need for tools, data, methods, guidance on how to make case for restoration of ecological systems and services.
- OSWER is looking to the long term benefits of the Agency's Economic Research Plan. The DFO agreed to provide Dr. Boyd with information on this plan and the SAB's review of it.

To what extent is RIA ecological benefit assessment geared toward (a) showing that the regulation's benefits exceed costs vs. (b) assessing the relative net benefits of a range of regulatory alternatives?

- OSWER provides multiple alternatives and provides cost/benefit analyses for all. It also identifies a preferred option for public comment.

To what extent do you think OMB requires monetization of benefits?

- OSWER sees itself as encouraged to monetize and would like to monetize as much as possible, but that is typically hard to do. For ecological benefits, it generally uses qualitative analyses, or indirect or associated benefits.
- OSWER received comment from OMB regarding its qualitative analysis. For example, in the case of one qualitative argument for benefits, OMB commented "This is not convincing" and asked OSWER to revise and strengthen the argument.

To what extent do you think qualitative communication of benefits is important to OMB?

- Very important. Dollar values need to be accompanied by explanations.

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What is your understanding of how uncertainty in ecological benefit assessment should be incorporated and acknowledged in RIAs?

- OMB asked for additional scenarios and discussion of costs and benefits of scenarios to minimize or maximize costs related to a certain assumption.

Are there standards for admissibility or adequacy for characterizing or measuring ecological benefits? Who sets them? Are there standards for admissibility for other kinds of benefits assessments that could inform how eco-benefits assessment standards should be set? What kinds of criteria or standards would be most useful? Please describe the ways in which economists and non-economists (e.g., ecologists) interact in the process of benefit assessment.

- This question doesn't apply directly to OSWER where there are not many ecologists. Question is more appropriate for ORD.

What are your perceptions of the barriers to or challenges associated with valuing the protection of ecological systems and services-- in principle and in practice.

- Major barrier is the quality of data. The Agency struggles with how to get better descriptions of how ecological systems are being restored -- e.g., what are the ecological benefits when a tank is leaking and is fixed. or when a Superfund site is restored. The Agency needs to know, both for rulemaking and GPRA, what is the ecological indicator, what are accepted methods for measuring to identify that indicator, and how to find the data.
- OSWER very troubled by the gap between benefit assessments for rulemaking and benefit assessments for GPRA. It doesn't make sense to have different metrics. The data and arguments we make for regulatory and non-regulatory activities for GPRA are different. They should dovetail better.

### **3. Audiences & Outcomes**

Who do you see as the audiences for RIA benefit analysis, and how would you rank them in terms of importance?

- Audiences are the regulated community and, for the proposed rule in question, judges. The public also reads rulemaking documents.

Apart from being a procedural requirement in the regulatory process, how do you think RIA assessments get used by other audiences?

- OSWER tries to envision impact on other parts of its program and impacts for future rules

In your personal view, have problems with benefit assessment affected either the development or promulgation of new regulations?

- In his experience, and he hasn't seen the full scope of comments for a full rule cycle, he does not think the science burdens are so massive as to have a chilling effect. Instead, he stated that the Agency needs to have good information in its rules; otherwise they won't stand up to challenges. Reviewers of rules in the public are becoming more sophisticated. It's incumbent to build in the best analysis up front. Perhaps OMB review and scrutiny has caused the Agency to reflect more about the rules it proposes or to seek non-regulatory approaches. He

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suggested that the C-VPES committee check with Jay Benforado's office in OPEI to see if they believe this has happened.

Discretionary, non-regulatory programs in OSWER are suffering from a resource shortage, but this is not due only to the demand for new requirements for rulemaking -- it is happening in the context of larger budget constraints.

Do you think all ecological benefits can and should be monetized (assuming the resources were available), or do you think there are limits to the usefulness of monetized information?

- Sees need for providing quantitative and qualitative contexts for communicating analyses of monetized effects.

Which is more important: analyses at the frontier of assessment science or analyses that are most easily understood by non-technical audiences?

- Sees this as an artificial choice - -why make it? The goal would be to use the best science and also be understandable.

Action items

1. Mr. Nicholas agreed to provide information on the costs involved in developing the economic assessment for the *All Appropriate Inquiries* proposal. (done and incorporated above)
2. DFO to provide Dr. Boyd with information on the Agency's Economic Research Plan and the SAB EEAC review of that document.
3. Suggestion that SAB check on impacts of OMB-required analyses on Agency's choice to pursue non-regulatory tools

**Interview with Mary Smith, Director of the OW/Office of Science and Technology Engineering and Analysis Division (EAD), Nick Bouwes, Chief, Economic and Environmental Assessment Branch, and Arnie Kusmack**

10-18-04

Introductory Discussion

EAD representatives gave background on the work of their division. They specified that the processes they would describe reflect procedures underway before the Steve Johnson memo. The Office of Water is working now to conform to new processes described in the memo. Two types of rulemaking activities undertaken by EAD may be relevant to the work of the Committee on Valuing the Protection of Ecological Systems and Services. Effluent guidelines set limit on industrial discharges. Section 316(b) of the Clean Water Act calls for minimizing environmental impacts of withdrawals from water bodies for cooling waters.

Recent focus on cost-benefit analysis for 316(b) reflects rulemakings undertaken to implement this provision of the Clean Water Act over the past four years. Effluent guidelines have a longer, 30-year history. They have traditionally relied on a cost-effectiveness benchmark, where decision-makers asked "how many reductions are we getting for costs?" Both types of regulations look at technology, then affordability. There has been increasing emphasis on benefit assessments for effluent guidelines, as demonstrated in the Combined Animal Feeding Operations rule. Increased emphasis on benefit analyses reflects OMB's heightened interest and is driven more by E.O. 12866 than by the requirements of the Clean Water Act itself.

Analyses of costs and benefits are important for OMB and senior managers. Benefits fall into two categories: ones that can be quantified and monetized and ones that can't. There are fewer tools for estimation of nonuse benefits and much discussion on the topic of those benefits both within EPA and with OMB. EPA acknowledges benefits that can't be quantified or monetized, but it is easier for decision makers to deal with quantified/monetized benefits. OMB wants to have the best analysis to quantify and monetize benefits. There is some guidance on non-use benefits, but the "devil is in the details." There seems to be agreement that contingent valuation studies might be the best tool to quantify non-use benefits, but there is little or no time to conduct contingent valuation studies tailored to a particular rulemaking. Instead, the Agency uses benefit transfer tools and there are questions from some about whether benefit transfer is a viable tool. The more skeptical person is about a given rule, the more that person "pokes more holes" in benefit transfer analysis.

Most rulemakings to date undertaken by EAD have been under court order. This time pressure makes economic analysis even more difficult. The typical schedule allows 2 years to develop a proposal and 2 years to develop a final rule. All data collection and analysis must be completed within this time frame. Analyses must be developed for both costs and benefits.

To develop a rule, EAD assembles a multi-disciplinary team of economists, statisticians, engineers, and ecologists within the division. An Agency workgroup is formed, usually with representatives from the Office of

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General Council, Office of Policy Economics and Innovation (NCEE and policy representatives), Regions, Office of Research and Development, and other offices, as needed. Efforts to collect information for effluent guidelines on emissions and costs involve time-consuming Information Collection Requests (ICRs), normally covering a survey of an entire industry with a detailed survey of a smaller subset of establishments. EPA approached OMB over two years ago with a proposal to develop a generic data collection protocol, but OMB denied this request. To meet court-ordered deadlines, OW must develop surveys, get approval for them, and implement them within tight time constraints that require maximum cooperation between EPA and OMB. EPA perceives it to be more difficult to get approval for ICRs for surveys related to benefits than for surveys related to costs. As a result, OW generally relies on benefits transfer. This is increasingly problematic.

Analyses based on benefit transfer are challenged where there is the "lack of an exact match" between the referenced literature and the policy scenario. For 316(b) regulations, there have not been published studies focusing on cooling water withdrawals and impacts on fish populations. OW has tried to draw on published studies describing reductions in fish populations and apply it to the policy scenario related to the rule. It has also developed alternative supporting the benefit transfer analyses (e.g., meta-analyses and RUM models) that identified a range of benefits and allowed consideration of a weight-of-evidence approach that would identify the values that "a practical person would accept." This approach was rejected by OMB, when OMB believed the data were not a sufficiently good fit with the policy context.

The Office of Water is attempting to develop a benefits survey for Phase 3 of the 316(b), because for Phase 2 the valuation methodologies used "ran into stumbling blocks." The Office is currently trying to process an ICR package through the system. The challenge is formidable. An ICR must be submitted and reviewed under the Paperwork Reduction Act (PRA) for permission to hold 4-5 focus groups of 10-15 people each. Once those Focus Groups are conducted, then a second ICR must be submitted for the contingent valuation survey that is based on the results of the Focus Group work. The EAD developed the ICR with contractor support and then sent that document through OPEI to OMB for publication in the Federal Register. OW is working with NCEE on the survey design. OW's Desk Officer at OMB, Jim Laity, has told the Agency that he will help the Agency process the ICR. In terms of the timetable, EAD made the decision to conduct the contingent valuation survey seven months ago. The final Phase 3 rule is due in June 2006.

OMB's review of ICRs involves detailed review of the draft contingent valuation survey and may include discussion and "bargaining" on the survey questions themselves. EAD can expect OMB to challenge questions on the rationale that similar information is available elsewhere in a different format. EAD is concerned that if it derived an analysis from such existing data, the analyses might be challenged because the benefit transfer analysis did not match the policy scenario closely enough.

There is a sense that OMB supports EPA's efforts to strengthen its analysis, but that OMB will be scrutinizing the ICR closely, probing every question. There is also the concern of whether OMB will agree that the Agency's plan to use "Knowledge Networks" will provide a sufficiently representative



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sample for the intended purpose of the survey. It would be helpful to have criteria for the statistical standard that EPA needs to meet for the survey in advance of developing the ICR.

Following this discussion and some detailed discussion of several questions detailed below, Dr. Bouwes provided a text with "Recommendations to Facilitate Ecological Benefit Estimates" for consideration by the Committee (Recommendations attached to this meeting summary)

### List of Questions for Fact Finding

#### **1) Procedural and Management Issues**

Describe the process by which EPA and OMB interact on RIAs. Is most interaction formal (e.g. "return letters") or informal. Who specifically is responsible for ongoing interactions and negotiation?

Usually the process involves informal meetings, phone calls, and emails.

Are RIA benefit assessments peer reviewed? If so, please describe the review process.

Peer review is formal and usually undertaken for novel approaches or major rules. The Office of Water follows EPA's peer review guidelines.

How are EPA analytical resources (for benefit assessments for RIAs) decided on? Who makes these decisions?

OW provides the resources for the analyses. Much of the economic benefit assessment work is developed by contractors.

#### **2) Analytical Methods**

Does the agency make use of standardized protocols/procedures for benefit assessment? If so, describe the nature of those protocols or procedures. What guidance documents currently exist for the assessment process?

The Office of Water follows the standard EPA guidance and the OMB draft Circular A-4. The Circular A-4 seems to call for a level of theoretical purity that "gets in the way of practical research." It does not seem realistic for the Agency, operating under current constraints, to fully satisfy some of the requirements detailed in that document.

To what extent is RIA ecological benefit assessment geared toward (a) showing that the regulation's benefits exceed costs vs. (b) assessing the relative net benefits of a range of regulatory alternatives?

To what extent do you think OMB requires monetization of benefits? Is quantification of some benefits instead of monetization useful?

Generally, both monetized and quantified information are presented side-by-side. For 316(b), OW provided an analysis of the numbers of fish likely to be entrained under different policy options. Providing quantitative information can also raise issues in analyses. In regard to quantifying bio-physical impacts for 316(b), OMB called for EPA to develop more detailed fish recruitment models that were species-specific and site-specific. OMB also asked the Agency about the significance of the billions of fish saved under different policy options in terms of impacts on fish populations. The Office of Water was faced with the legal and intellectual challenge of isolating the impact of a change in one provision of the Clean Water Act on an entire ecosystem.

To what extent do you think qualitative communication of benefits is important to OMB?

Additional qualitative discussion does not seem useful in convincing OMB or others of impacts that cannot be monetized or quantified. More could be done, however, in presenting and framing EPA's arguments. EPA may censor itself in terms of the conclusions that should be drawn from the qualitative and quantitative evidence.

Please describe the ways in which economists and non-economists (e.g., ecologists) interact in the process of benefit assessment.

The Economics and Environmental Assessment Branch includes economists and environmental assessors. The industry surveys conducted for effluent guidelines give information about the industry baseline. Engineers identify technology options being considered. Ecologists analyze the changes in loadings and the impacts of those loads on changes in use designation. Economists then analyze benefits and costs.

### **3) Audiences & Outcomes**

In your personal view, have problems with benefit assessment affected either the development or promulgation of new regulations?

Decision makers think seriously about benefit assessments. How benefits are framed and analyzed does affect how much environmental protection EPA can justify. EAD is frustrated by inability to monetize adverse effects that it know are happening but does not currently have tools to measure.

**Recommendations to Facilitate Ecological Benefits Estimates Received from Nick Bouwes, OW, 10-28-04**

Streamline the ICR Process. The current ICR process is a deterrent to conducting primary research. The time period required to obtain approval to undertake a contingent valuation study limits the agency's ability to perform primary research in a timely fashion. The procedure would benefit from an expedited independent review panel to evaluate the ICR and provide recommendations that are binding to the regulatory agency and OMB.

- 1) Identify Nonuser Populations. Currently when estimating nonuse benefits primary emphasis is placed on the WTP for ecological improvement methodology. However, often the primary driver in the total benefit estimate is the size of the relevant population assumed to hold these WTP values. Presently a consensus is lacking regarding what is deemed to be a reasonable representation of the relevant population. Nonuser surveys may hold the key to understanding the size of the populations associated with various ecological benefit categories. Such information could help provide upper- and lower-bounds for non-use benefit estimates.
- 2) Studies to Estimate WTP to Reduce Risk. Currently human health benefits are discounted from time of disease onset because VSL studies are based on wage differential for risk of death in the work place. As a result human health benefits are discounted at some distant point in the future. An analogous circumstance exists with ecological benefits. Studies focusing on what society is WTP to reduce risk (assumed to occur at time of rule promulgation) will provide a more accurate estimate of benefits associated with EPA's regulatory initiatives and possibly mitigate the significant role played by discounting human health and ecological impacts that often occur long time periods beyond the effective date of a rulemaking.
- 3) Research on Ethics, Property Rights of Future Generations, and Commons. Currently discounting is performed with the assumption that current generation incur both the costs and resulting benefits of regulations and thus the same discount rate is used to discount both the benefits and costs. However, if the inheritance of an unspoiled ecological system is an entitlement to future generations and therefore a responsibility of the current generation then the discount rate of benefits accruing to future generations might arguably be zero. Such considerations will have major implication with respect to environmental regulation policy.
- 4) Studies to Establish WTP Bounds of Ecological Benefits. The ability to accurately estimate the ecological benefits of regulation options in a timely fashion can compromise the forging of any regulation at all. It may be possible that ecological benefits lie within range. A priori knowledge of this range, and the lower bound in particular, may be sufficient to expedite the passage of regulation.

- 5) Research to Consider Benefit Contribution of Single Source Pollutant in Multiple Source Polluted Ecosystems. When ambient pollutant concentrations are excessively high and contributions are attributable to several sources (e.g., point, non-point, and air deposition of nitrogen to a water body) a circumstance may exist where reductions in pollutant concentrations from only one source may not be sufficient to generate benefits, but benefits would be possible if all pollutant source contributions were reduced. If regulatory jurisdiction rest with separate media offices or agencies, then currently without a coordinated regulatory effort no regulation would occur. Studies should be undertaken to ascertain what the benefit contribution would be for each source reduction had a coordinated rule making effort be enacted. Such work could be used to promote such an approach in the absence of coordinated rule making efforts.

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**Discussion with EPA's Office of Water's Water Policy Staff**

**September 22, 2004**

**Participating: Sharon Hayes, Bill Anderson**

**Participating from SAB and the SAB Staff Office: James Boyd and Angela Nugent (Designated Federal Officer for the Committee)**

List of Questions for Fact Finding

**1. Procedural and Management Issues**

Describe the process by which EPA and OMB interact on RIAs. Is most interaction formal (e.g. "return letters") or informal. Who specifically is responsible for ongoing interactions and negotiation?

- Formal reviews happen for economically significant rules and other rules that OMB identifies for review. Reviews are scheduled for 90 days but negotiated time frames between EPA and the OMB desk officer do occur. The formal process can involve many exchanges with the desk officer. NCEE generally plays no direct role at this point.

OMB's review encompasses the type and nature of the options presented, how they are framed by the Agency and how economic analyses support those options. NCEE's review, instead, focuses on methodology for the economic analysis.

NCEE's role is evolving after Steve Johnson's memo was issued. How the economics subgroup will be chaired is an issue now -- whether it should be co-chaired by the program office and NCEE. Currently, the process for establishing the economic subgroup is being developed. There are so many other issues involved in rulemaking (legal issues, technology, enforceability, etc.) that economics is a small piece of the puzzle. Implementing an economic subgroup is difficult within timelines for producing a rule, particularly those with legal (court-ordered or consent decree) and statutory deadlines, and also difficult for program offices because of staffing constraints -- OW has approximately 8 to 10 staff-economists working at the program level to support the work load. Many of those economists supervise contractors' work on rulemaking support documents. With more attention being given to OMB circular A-4, which will be enforceable in 2005, OW could "do more with more economists."

- NCEE's, like OPEI role generally, has had a long history as an oversight group. Although the extra layer of review that NCEE provides has been helpful, program offices see it as an extra level of review that is potentially burdensome and time consuming, especially under the pressures of court-ordered rulemaking. OPEI and its predecessor office OPPE have moved in and out of the review process, often because review functions can be burdensome and complex.

Are RIA benefit assessments peer reviewed? If so, please describe the review process.

- Pieces of benefit assessments are peer reviewed, usually via an Agency specialized peer review contract vehicle. For 316(b) Phase 2, for example, analyses of non-use benefits and fish entrainment were peer reviewed. Generally,

peer review applies to novel or unique components of a benefits analysis. It would be very unusual to peer review a whole benefit assessment for a rule.

At what stages of the assessment process does EPA obtain public/stakeholder input? How does EPA do this? What are the types of input it receives?

The economic analysis for a proposed rule is provided to the public for comment as part of the entire rulemaking notice and comment process, and those comments and associated comment responses developed by the Agency are placed in the public record.

When does EPA request permission to collect new information to support an RIA benefit assessment? How does OMB review these requests? Does EPA feel that it is given sufficient latitude/time/resources to obtain the information it needs?

- Most rulemakings require Information Collection Requests (ICRs) of some kind. Often it is difficult to get those reviewed and accepted, but if a rule is driven by a statutory or court-ordered process, there is a greater likelihood. These ICRs are generally not focused on ecological benefit information, however. ICRs to gather economic data unrelated to a specific rulemaking can take a long time in the approval process, such as the Valuing Inland Water Quality Improvements Survey Request to update the Mitchell and Carson study.

## **2. Analytical Methods**

Does the Agency make use of standardized protocols/procedures for benefit assessment? If so, describe the nature of those protocols or procedures. What guidance documents currently exist for the assessment process?

- The Agency has not made many forays into ecological benefit assessment and lacks practical, reasonable tools. When there is a rule that seems to be associated with ecological benefits, EPA assembles in-house experts and external consultants. Their design for the economic analysis is constrained by the limits of time and resources and what they believe will be acceptable in the review cycle. The Agency draws on institutional memory, experience, and history with previous rulemakings to decide on which approaches and data to include and which not to include.

OMB's Circular A-4 is broad; it might be helpful to know more explicitly what would be acceptable.

The big challenge is to characterize non-use benefits. SAB and other outside groups' attention to those would be helpful. It appears that A-4 guidance might be more limiting than the NOAA panel's position on the use of CV analysis.

In general, OW is doing benefits transfer and not original studies.

To what extent is RIA ecological benefit assessment geared toward (a) showing that the regulation's benefits exceed costs vs. (b) assessing the relative net benefits of a range of regulatory alternatives?

- OW looks at the net benefit for a range of alternatives. Analysts seriously try to assign value to all benefit categories, depending on time, data, and resource constraints.

To what extent do you think OMB requires monetization of benefits?

- Currently, OW for ecologically oriented rules is focusing on dollars and is primarily capturing recreational benefits. Quantified indicators or qualitative discussions seem less important. There is a sense that OW can do more in quantifying and describing effects qualitatively. A-4 opens the door.

To what extent do you think qualitative communication of benefits is important to OMB?

What is your understanding of how uncertainty in ecological benefit assessment should be incorporated and acknowledged in RIAs?

Are there standards for admissibility or adequacy for characterizing or measuring ecological benefits? Who sets them? Are there standards for admissibility for other kinds of benefits assessments that could inform how eco-benefits assessment standards should be set? What kinds of criteria or standards would be most useful?

Please describe the ways in which economists and non-economists (e.g., ecologists) interact in the process of benefit assessment.

- Improved collaboration between economists and ecologists and other non-economists is emphasized whenever ecological benefits are discussed. Economists are generally driven by time and resources to look for endpoints for which there are readily available data from the existing literature. It's important to take note that where there aren't data or where effects are not known, it is critical to involve ecologists and biologists. It would be good to interview Doug Norton, an ecologist in OW as part of the SAB fact-finding.

What are your perceptions of the barriers to or challenges associated with valuing the protection of ecological systems and services-- in principle and in practice.

How do EPA methods compare to those used by other agencies (COE, NOAA, DOI) with environmental missions?

Has the practice of benefit assessment changed significantly in recent years? If so how? If not, how long have current practices prevailed?

### **3. Audiences & Outcomes**

Who do you see as the audiences for RIA benefit analysis, and how would you rank them in terms of importance?

- Often the courts are overlooked as a potential audience. Courts focus on what the statutes require - such as cost quantification. Benefits, however, are not the focus of the courts. The Clean Water Act focuses clearly on water quality but not so clearly on ecological benefits.

In your personal view, have problems with benefit assessment affected either the development or promulgation of new regulations?

- Yes, problems in monetizing benefits can shape decisions. They can affect the alternatives identified and the policy option chosen.

**Summary of information and other fact-finding for discussion by the SAB C-VPES. Interview summaries provided to Agency staff; their comments have been incorporated. Please DO NOT CITE OR QUOTE -- DRAFT 4/4/05**

Do you think all ecological benefits can and should be monetized (assuming the resources were available), or do you think there are limits to the usefulness of monetized information?

- It is currently difficult to see how quantification without monetization would be used or would be helpful.

Which is more important: analyses at the frontier of assessment science or analyses that are most easily understood by non-technical audiences?

- OW is currently developing an action plan, following up on the Agency's draft Ecological Benefit Strategic Plan, where it will be reaching out to different audiences to see how analyses could best reach them.



**Interview with Dr. Douglas Norton, Office of Wetlands, Oceans and Watersheds  
November 23, 2004**

Dr. Norton began the discussion by noting that he hasn't witnessed directly the interactions between EPA and OMB involved in rulemaking, although he did provide some information at one stage in the process of developing the Agency's 316(b) Cooling Water Intake Rule. He suggested that for more information on involvement of ecologists in rulemaking the SAB Committee on Valuing the Protection of Ecological Systems and Services discuss this with Ms. Christine Ruf, another ecologist in the Office of Water (OW), who had been involved in the 2000 proposed TMDL rule effort and the more recent TMDL Watershed Rule. Other ecologists in the Office of Water to contact might be Ashley Allen in Office of Science and Technology and John McShane in the Oceans Division of the Office of Oceans, Wetlands and Watersheds.

Dr. Norton suggested that ecologists within the Office of Water and across the Agency are distributed widely through OW and are not as centrally organized as OW's Immediate Office economists. The Office of Water's Office of Wetlands, Oceans and Watersheds (OWOW) has a significant number of ecologists because the "Watershed" is an ecological concept. He noted that fewer than 20% of OWOW's personnel are ecologists. OWOW presently does not have an economist, but the office is currently planning to hire one. He noted that the Office of Water's Office of Science and Technology has several economists and that economists and ecologists collaborate across the offices. The Office of Research and Development has quite a few ecologists and they play an important role in the Agency. He noted the importance of ecological research even in areas that the Clean Water Act doesn't directly regulate. He emphasized the importance of looking at the full picture of ecosystem effects. ORD's research is needed to provide a full picture of impairment. ORD researchers help build the science that helps regulators understand ecosystems where regulations happen.

In regard to rulemaking activity, from his perspective, he has observed an inconsistency in interactions with OMB that he cannot explain. He hears that in most rulemakings, OMB looks for monetized expressions of benefits. Yet the Executive Order, OMB guidance, and EPA's guidance calls for a characterization of benefits in quantitative terms or even qualitative terms if benefits cannot be monetized. Those documents call for a full characterization of all benefits with a discussion of their ramifications so that decision makers can be fully informed. He hears that attention is not paid to benefits that are not monetized and that OMB seems oriented to or limited by a monetized approach.

When asked about the recent Cooling Water Intake Rule, Dr. Norton mentioned that he was not familiar with the details of OW's analysis of ecological significance. He understood that monetization was generally limited to certain limited aspects (e.g., commercial fishing, recreational fishing). Coastal power plants, however, raise many issues affecting ecosystems and ecological resources. For example, water bird populations eat fish. Small coastal communities gain some economic benefits from eco-tourism associated with bird watching.

**Summary of information and other fact-finding for discussion by the SAB C-VPRESS. Interview summaries provided to Agency staff; their comments have been incorporated. Please DO NOT CITE OR QUOTE -- DRAFT 4/4/05**

When asked about the peer review process within the Office of Water for benefit assessments, Dr. Norton responded that he didn't know what if any formal process exists specifically for benefits assessments. He suggested that the Agency's new *Ecological Benefit Assessment Strategic Plan* outlined a need for a clearer process.

When asked about the type of training EPA provides for its own or outside personnel involved in ecological benefit assessment for RIAs, Dr. Norton responded that John Powers has developed an economic training course, and that there are many of avenues for training in ecological risk assessment. For general ecological training oriented toward watershed ecology, the Watershed Academy provides on-line training and in the past, when resources were more available, provided in-person training to personnel in EPA regional offices, states, and other organizations. Eight hundred people in 49 states and 20 countries have earned certificate, The Academy has two modules on environmental economics. The Watershed Academy is also available as a CD.

Dr. Norton suggested that ecological benefit assessment had some lessons to learn from EPA's experience with ecological risk assessment. Cross-disciplinary collaboration is essential as well as communications with decision makers and stakeholders. He noted that the Agency's draft *Ecological Benefit Assessment Strategic Plan* relies on the Ecological Risk Assessment paradigm along with economic assessment methods to produce an integrated approach. He sees much wisdom in that paradigm and sees broad applicability, while acknowledging that ecological risk assessment is "not a tool for every job." It offers the benefits of: 1) leading people to lay out options and effects as part of project planning; 2) looking at all possible outcomes of a decision; 3) merging measurement endpoints and indicators with assessment endpoints (it is important to have a process to determine what is valued--there is a need for social interaction on that issue and then to build assessments around those interactions); and 4) it is oriented toward risk management, not "analysis for the sake of analysis" and risk communication. He suggested that economists should take opportunities to improve the breadth of their economic outlook by incorporating ecological risk assessments into their analyses. Economists would also benefit from talking with watershed stakeholders about values, including the value of potential outcomes to future generations. He suggested that economists' traditional neo-classical approach to discounting the value of ecological services for future generations would make most watershed stakeholders aghast.

For examples of applications of ecological risk assessments, Dr. Norton suggested the five watershed ecological case studies conducted by the Office of Research and Development. He noted that they were minimally funded and yet had some success despite those funding limitations. Information about these case studies can be found on the web at:

<http://cfpub2.epa.gov/ncea/cfm/recordisplay.cfm?deid=23734>

Summary of information and other fact-finding for discussion by the SAB C-VPES. Interview summaries provided to Agency staff; their comments have been incorporated. Please DO NOT CITE OR QUOTE -- DRAFT 4/4/05

**Attachment 2: Letter from Dr. John Graham to Dr. Vanessa T. Vu, December 2004**

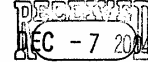
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EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF MANAGEMENT AND BUDGET  
WASHINGTON, D.C. 20503

DEC 2 2004



Vanessa T. Vu, Ph.D.  
Director  
Office of the Administrator  
Science Advisory Board  
U.S. Environmental Protection Agency  
Washington, DC 20460

Dear Dr. Vu:

Thank you for your October 4, 2004, letter regarding the Science Advisory Board's Committee on *Valuing the Protection of Ecological Systems and Services*. That letter included a list of questions covering a variety of topics related to the Office of Management and Budget's role in the development and analysis of regulations.

Enclosed are answers to those questions. I hope they are helpful to the Committee. Please let me know if I or my staff can be of further assistance.

Sincerely,

John D. Graham, Ph.D.  
Administrator  
Office of Information  
and Regulatory Affairs

Enclosure

#### Interview Questions for OMB

#### **EPA Science Advisory Board Committee on Valuing the Protection of Ecosystem Services (C-VPES)**

The purpose of this fact-finding is to inform the Committee about the development of benefit assessments as part of Regulatory Impact Analyses (RIAs) for rules with significant ecological protection components. The Committee wishes to understand more fully the process for EPA's development of those documents beyond the information provided in OMB's Circular A-4 and how the Agency's interactions with OMB contribute toward building the science for benefit assessment. The Committee is undertaking this fact-finding as one part of its larger mission to assess Agency needs and the state of the art and science of valuing protection of ecological systems and services, and then to identify key areas for improving knowledge, methodologies, practice, and research.

Because this "fact-finding" is undertaken as part of the Federal Advisory Process for the SAB C-VPES, the DFO will handle all communications related to these interviews, be present for all meetings and conversations, and prepare written summaries of the meetings. All discussions will be documented and available to the public as part of the Committee's records under the Federal Advisory Committee Act. Summaries of these interviews will be made available to the Committee. It is important for all persons interviewed to know that the discussions are on the record and will be documented. If any additional questions arise, or if clarifications need to be made, please contact the Designated Federal Officer for the Committee, Dr. Angela Nugent at [nugent.angela@epa.gov](mailto:nugent.angela@epa.gov) or 202-343-9981.

To the greatest extent possible, the Committee wishes these conversations to be informal and frank. The truer the picture, the better advice this Committee can give EPA.

Interviewees are asked to address any issues you feel are pertinent to the discussion. As a starting point, however, Dr. James Boyd, Senior Fellow and Director, Energy and Natural Resources Division, Resources for the Future, and the lead for the Committee's fact-finding, will ask the following questions.

#### List of Questions

#### EPA RIA Development; Process and Interactions with OMB

1. **How does OMB work with EPA to implement the review process described in circular A-4?**

Pursuant to EO 12866, OIRA reviews drafts of all significant regulatory actions and accompanying analyses prior to publication of both the proposed and final rules. Typically OIRA staff first read the materials the agency submits for review. Our review of the draft rule and accompanying analyses addresses the regulatory principles that are set forth in EO 12866 and, with respect to our evaluation of the anticipated benefits

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and costs of the draft rule, we apply the criteria contained in Circular A-4. Other Federal agencies with an interest in the rule may also participate in this review, and may provide technical and scientific advice as well as their policy and legal views. In addition, the agency may consult with us on the application of Circular A-4 outside of the formal review process. This consultation may relate either to general issues that cut across rules, or to the early stages of analysis for a particular rule.

2. **How much cross-office collaboration does OMB observe? How much cross-agency collaboration?**

During our review of a draft rule, OIRA staff generally work with the EPA program office that is developing the rule. In addition, it has been our experience that EPA's Office of General Counsel and Office of Policy, Economics, and Innovation often participate in our review; EPA's Office of Research and Development may also participate in some of our reviews. [See answer to questions #9 and #1.]

Analytical Methods

3. **Do you observe the Agency making use of standardized protocols/procedures for benefit assessment?**

Yes, EPA has developed guidelines for the development of regulatory analysis. These guidelines have been reviewed by the SAB.

4. **For proposed and final rules, to what extent *should* RIA ecological benefit assessment be geared toward (a) showing that the regulation's benefits exceed costs vs. (b) assessing the relative net benefits of a range of regulatory alternatives? What is the current state of practice?**

Benefit-cost analysis is a primary tool used for regulatory analysis. It provides useful information to decisionmakers and the public, even when economic efficiency is not the only or the overriding public policy objective. A good regulatory analysis informs decisionmakers, other parts of the government, and the public of the effects of the selected option and any reasonable alternatives. Thus, as Circular A-4 states, a benefits assessment should provide the estimates of incremental net benefits across a range of regulatory alternatives.

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5. **To what extent and in which circumstances does OMB require monetization of benefits?**

OMB A-4 Guidelines state that "You should develop quantitative estimates and convert them to dollar amounts, if possible. In many cases, quantified estimates are readily convertible, with a little effort, into dollar equivalents."

"If monetization is impossible, explain why and present all available quantitative information. For example, if you can quantify but cannot monetize increases in water quality and fish populations resulting from water quality regulation, you can describe benefits in terms of stream miles of improved water quality for boaters and increases in game fish populations for anglers. You should describe the timing and likelihood of such effects and avoid double-counting of benefits when estimates of monetized and physical effects are mixed in the same analysis."

6. **To what extent and in which circumstances does OMB believe other quantitative or qualitative communication of benefits are appropriate and important?**

We recognize that it is not always possible to quantify important categories of benefits or cost. OMB A-4 Guidelines state that:

"If you are not able to quantify the effects, you should present any relevant quantitative information along with a description of the unquantified effects, such as ecological gains, improvements in quality of life, and aesthetic beauty. You should provide a discussion of the strengths and limitations of the qualitative information. This should include information on the key reason(s) why they cannot be quantified."

"For cases in which the unquantified benefits or costs affect a policy choice, you should provide a clear explanation of the rationale behind the choice. Such an explanation could include detailed information on the nature, timing, likelihood, location, and distribution of the unquantified benefits and costs. Also, please include a summary table that lists all the unquantified benefits and costs, and use your professional judgment to highlight (e.g., with categories or rank ordering) those that you believe are most important (e.g., by considering factors such as the degree of certainty, expected magnitude, and reversibility of effects)."

"In such cases, you should exercise professional judgment in determining how important the non-quantified benefits or costs may be in the context of overall analysis. If the non-quantified benefits and costs are likely to be

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important, you should carry out a "threshold" analysis to evaluate their significance. Threshold or "break-even" analysis answers the question, "How small could the value of the non-quantified benefits be (or how large would the value of the non-quantified costs need to be) before the rule would yield zero net benefits?" In addition to threshold analysis you should indicate, where possible, which non-quantified effects are most important and why."

7. **What is OMB's understanding of how uncertainty in ecological benefit assessment should be incorporated and acknowledged in RIAs?**

Under Circular A-4, the regulatory analysis should provide expected-value estimates as well as distributions about the estimates, where such information exists. If the regulatory analysis provides only upper and lower bounds (in addition to best estimates), it should, if possible, present the 95 and 5 percent confidence bounds. While OMB encourages the analyst to develop estimates that capture the distribution of plausible outcomes for a particular alternative, detailed reporting of such distributions is not required, but should be available upon request.

For major rules involving annual economic effects of \$1 billion or more, the Circular provides that an agency should present a formal quantitative analysis of the relevant uncertainties about benefits and costs. In other words, the agency should provide some estimate of the probability distribution of regulatory benefits and costs. In summarizing the probability distributions, the agency should provide some estimates of the central tendency (e.g., mean and median) along with any other information that may be useful such as ranges, variances, specified low-end and high-end percentile estimates, and other characteristics of the distribution.

The principles of full disclosure and transparency apply to the treatment of uncertainty. Under the Circular, when there is significant uncertainty and the resulting inferences and/or assumptions have a critical effect on the benefit and cost estimates, the regulatory analysis should describe the benefits and costs under plausible alternative assumptions.

Uncertainty in ecological benefits assessment would be addressed under these general principles. There are no specific principles that apply uniquely to the assessment of these benefits.

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8. **Are there standards for admissibility or adequacy for characterizing or measuring ecological benefits?**

Because of the influential nature and special role that regulatory analysis has in the rulemaking process, it is appropriate to set minimum quality standards for regulatory analysis. The agency should provide documentation that the analysis is based on the best reasonably obtainable scientific, technical, and economic information available. To achieve this, Circular A-4 provides that the agency should rely on peer-reviewed literature, where available, and provide the source for all original information.

The A-4 guidelines require that the regulatory analysis meet EPA's Information Quality Guidelines and the Information Quality Guidelines issued by OMB. In addition, the A-4 guidelines provide criteria that the agency should consider in using benefit transfer methods and in applying valuation estimates from studies using states preference methods (e.g., contingent valuation).

The measurement of ecological benefits would be addressed under these general principles. There are no specific principles that apply uniquely to the measurement of these benefits.

9. **Please describe the ways that you observe economists and non-economists (e.g., ecologists) interact in the process of benefit assessment.**

The EPA program office provides a draft regulatory analysis that represents the cumulative efforts of EPA staff. Briefings of OMB staff are often supplied by EPA staff with different technical backgrounds.

10. **How do EPA methods compare to those used by other agencies (COE, NOAA, DOI) with environmental missions?**

EPA has in several recent rules attempted to develop quantified estimates of ecological benefits. DOI and NOAA issue regulations designating critical habitat for endangered and threatened species, which specifically identify acreage and stream miles of critical habitat and provide a qualitative description of the value of such habitat to the conservation of the species. In general, DOI and NOAA have not attempted to quantify the ecological benefits of such designations. However, DOI has recently introduced the use of hedonic studies to quantify the benefits to property values from the protection of open space. We are not aware of any



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attempts by the ACOE to quantify ecological benefits as part of its rulemaking analyses.

11. **Has the practice of benefit assessment changed significantly in recent years? If so how? If not, how long have current practices prevailed?**

Changes in the practice of benefit assessment have been marked by a progression or evolution, rather than by a marked departure from past practices. In recent years, EPA has expanded the categories of benefit end-points identified (both health and welfare end-points) within rules and increased its effort to quantify and monetize benefits across rulemakings.

EPA has increased its efforts to improve consistency in its quantification and monetization of benefits across rulemakings. EPA has also expanded its efforts to use stated preference and benefits transfer methodologies to monetize benefits. With regards to uncertainty analysis of benefits, EPA is beginning to take important steps forward.

#### Audiences & Outcomes

12. **Other than decision makers at EPA and OMB, who do you see as the audiences for RIA benefit analysis?**

Other audiences include Congress, other federal agencies, state, local, tribal, and foreign governments, affected parties and the public.

13. **Apart from being a procedural requirement in the regulatory process, how do you think RIA assessments get used by other audiences?**

First and foremost, RIA assessments support informed decision making and public comment on specific rules.

We believe RIA assessments are used by a variety of audiences in the long-term discussion of the proper course for future Federal regulatory policy.

14. **Which is more important: analyses at the frontier of assessment science or analyses that are most easily understood by non-technical audiences?**

Both are important. Regulatory analyses are often conducted under tight deadlines and with restricted resources. We encourage agencies to achieve the best analyses possible – within these restrictions it is perhaps easier to obtain analyses that are more easily understood by non-technical audiences.

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Pushing analyses to the frontier of assessment science requires a longer-term research plan and institutional strategy.

Summary of information and other fact-finding for discussion by the SAB C-VPES. Interview summaries provided to Agency staff; their comments have been incorporated. Please DO NOT CITE OR QUOTE -- DRAFT 4/4/05

**Attachment 3: EPA Rules with Ecological Considerations - Selected for Analysis by the SAB's Committee on Valuing the Protection of Ecological Systems and Services**

**Recent EPA Rules with Ecological Considerations - Selected for Analysis by the SAB's Committee on Valuing the Protection of Ecological Systems and Services**

2004 Aquaculture Rule (Final 2004; Proposed 2002)

- Economic and Environmental Impact Analysis of the Proposed Effluent Limitations Guidelines and Standards for the Concentrated Aquatic Animal Production Industry September 2002  
<http://www.epa.gov/guide/aquaculture/ea/fronttoc.pdf>

2004 Cooling Water Rule: National Pollutant Discharge Elimination System—Final Regulations To Establish Requirements for Cooling Water Intake Structures at Phase II Existing Facilities (2004 Final rule and 2002 Proposed Rule)

- 2004 Economic and Benefits Analysis for the Final Section 316(b) Phase II Existing Facilities Rule (EPA-821-R-04-005)  
<http://www.epa.gov/waterscience/316b/econbenefits/final/toc.pdf>
- Economic and Benefits Analysis for the Proposed Section 316(b) Phase II Existing Facilities Rule (EPA-821-R-02-001)  
<http://www.epa.gov/waterscience/316b/econbenefits/toc.pdf>

2004 Construction and Development Effluent Guideline -- Economics Analysis Supporting the "Effluent Limitations Guidelines and New Source Performance Standards for the Construction and Development Category

- Economics Analysis Supporting the Effluent Limitations Guidelines and New Source Performance Standards for the Construction and Development Category EPA-821-R-02-008:  
<http://www.epa.gov/waterscience/guide/construction/econ/final.htm>

2004 OSWER "All Appropriate Inquiries" Proposed Rule

- Economic Analysis for OSWER "All Appropriate Inquiries" proposed rule is available in the Superfund eDocket at  
<http://docket.epa.gov/edkpub/index.jsp>

2003 Proposed Interstate Air Quality Rule (December 17, 2003)

- Impacts of Proposed Interstate Air Quality Rule described on the web at:  
<http://www.epa.gov/interstateairquality/impact.htm>

2003 National Pollutant Discharge Elimination System Permit Regulation and Effluent Guidelines and Standards for Concentrated Animal Feeding Operations (CAFOs)

- Economic Analysis of the Final Revisions to the NPDES and Effluent Guidelines for CAFOs (EPA-821-R-03-002).  
<http://cfpub.epa.gov/npdes/afo/cafodocs.cfm>

2000 Final Rule To Amend the Final Water Quality Guidance for the Great Lakes System To Prohibit Mixing Zones for Bioaccumulative Chemicals of Concern

**Summary of information and other fact-finding for discussion by the SAB C-VPES. Interview summaries provided to Agency staff; their comments have been incorporated. Please DO NOT CITE OR QUOTE -- DRAFT 4/4/05**

- Economic analysis discussed in Federal Register Notice 65 FR 67638-67651 on the web at <http://www.epa.gov/fedrgstr/EPA-WATER/2000/November/Day-13/w28709.htm>

1999 Regional Haze Rule (2004 Final Rule)

- Regulatory Impact Analysis For The Final Regional Haze Rule Prepared By The Innovative Strategies & Economics Group Air Quality Strategies & Standards Division Office Of Air Quality Planning & Standards Office Of Air & Radiation U.S. Environmental Protection Agency April 22, 1999  
Zip files at: <http://www.epa.gov/ttn/ecas/ria.html>

1998 NOx SIP Call (Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group (OTAG) Region for Purposes of Reducing Regional Transport of Ozone)

- Regulatory Impact Analysis For the NOx SIP Call, FIP, And Section 126 Petitions  
Zip files at: <http://www.epa.gov/ttn/ecas/ria.html>

1997 Final air quality standards for ozone and particulate matter on July 16, 1997

- Regulatory Impact Analyses for the Particulate Matter and Ozone National Ambient Air Quality Standards and Proposed Regional Haze Rule Zip  
<http://www.epa.gov/ttn/oarpg/naaqsfin/ria.html>

Additional Rules Mentioned in Interviews as Potentially Important for Possible Impacts on Future Ecological Rulemaking

2004 Clean Air Nonroad Diesel Rule

- Regulatory Impact Analysis (EPA420-R-04-007, May 2004)  
(Significant for use of expert elicitation)